

Dubner's conjecture

Dubner's conjecture is an as yet (2018) unsolved conjecture by American mathematician [Harvey Dubner](#). It states that every even number greater than 4208 is the sum of two t-primes, where a t-prime is a prime which has a twin. The conjecture is computer-verified for numbers up to 4×10^{11}

Even numbers that make an exception are: 2, 4, 94, 96, 98, 400, 402, 404, 514, 516, 518, 784, 786, 788, 904, 906, 908, 1114, 1116, 1118, 1144, 1146, 1148, 1264, 1266, 1268, 1354, 1356, 1358, 3244, 3246, 3248, 4204, 4206, 4208.

The conjecture, if proved, will prove both the [Goldbach's conjecture](#) (because it has already been verified that all the even numbers $2n$, such that $2 < 2n \leq 4208$, are the sum of two primes) and the [twin prime conjecture](#) (there exists an infinite number of t-primes, and thus an infinite number of twin prime pairs).

Whilst already itself a generalization of both these conjectures, the original conjecture of Dubner may be generalized even further:

- For each natural number $k > 0$, every sufficiently large even number $n(k)$ is the sum of two $d(2k)$ -primes, where a $d(2k)$ -prime is a prime p which has a prime q such that $d(p,q) = |q - p| = 2k$ and p, q successive primes. The conjecture implies the Goldbach's conjecture (for all the even numbers greater than a large value $\ell(k)$) for each k , and the [de Polignac's conjecture](#) if we consider all the cases k . The original Dubner's conjecture is the case for $k = 1$.
- The same idea, but p and q are not necessarily consecutive in the definition of a $d(2k)$ -prime. Again, the Dubner's conjecture is a case for $k = 1$. It implies the Goldbach's conjecture and the generalized de Polignac's conjecture (if we consider all the cases k) are concerned.

Further reading

- Harvey Dubner (2000), *Twin Prime Conjectures*, [Journal of Recreational Mathematics](#), volume 30, issue 3, pp. 199–205
 - Jean-Paul Delahaye (June 2002), *Nombres premiers inévitables et pyramidaux*, [Pour la Science](#), issue 296, pp. 98–102
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